

REMARKS

Claims 1-33 are pending in the present application. By this Amendment, the specification is amended. Amendments to the specification are provided in the Revised Amendment Format approved by the USPTO and described in a February 19, 2003 pre-OG Notice. Applicants respectfully request reconsideration of the present claims in view of the foregoing amendment and the following remarks.

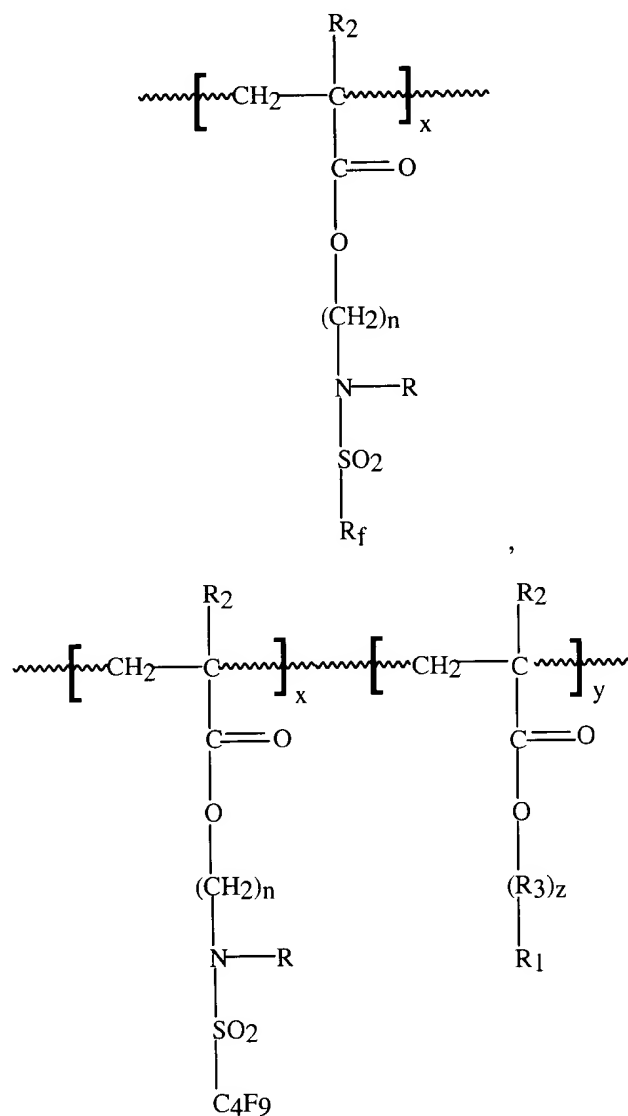
I. Prior Art Rejections:

Claim Rejections Under 35 U.S.C. §103(a)

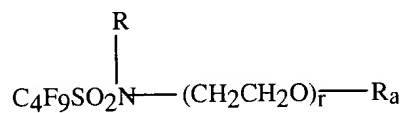
Rejection of Claims 1-13, 18-21, 23 and 26-30 In View Of Held In Combination With Savu

Claims 1-13, 18-21, 23 and 26-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,852,075 to Held (hereinafter, "Held") in view of International Publication No. WO 01/30873 to Savu et al. (hereinafter, "Savu"). This rejection is respectfully traversed.

Applicants' claimed invention, as embodied in independent claim 1, is directed to an inkjet ink composition comprising, *inter alia*, a colorant; a vehicle; and a fluorochemical surfactant; wherein the fluorochemical surfactant comprises one or more surfactants having one or more chemical structures selected from:



and



wherein ~~~~~ represents a bond in a polymer chain; R_f is $-\text{C}_4\text{F}_9$ or $-\text{C}_3\text{F}_7$; R , R_1 , R_2 and R_a are each independently hydrogen or alkyl groups having 1 to 4 carbon atoms; R_3 comprises one or more straight or branched polyalkylene-oxy groups having 2 to 6 carbon atoms

in each group; n is an integer from 2 to 10; x, y and z are integers of at least 1; and r is an integer of 2 to 20.

As discussed in the "Background of the Invention" section of Applicants' specification, fluorinated surfactants have been known as effective materials for providing desirable performance requirements and surface wetting characteristics. However, the problem of foaming in ink jet ink applications is still a problem when using known fluorinated surfactants. See Applicants' specification, from page 1, line 23 to page 2, line 12. Applicants' present invention addresses the problem of foam associated with known fluorinated surfactants in ink jet ink applications by the discovery that specific fluorochemical sulfonamide surfactants (also referred to herein as "C4 fluorinated surfactants" due to the presence of four carbon atoms in the fluorinated moiety) may be used in ink jet ink applications without generating undesirable levels of foam.

The disclosure of Held relates to surfactant systems for ink jet ink compositions. Specifically, the disclosure of Held relates to ink jet ink compositions containing a surfactant system, wherein the surfactant system consists essentially of (i) at least one siloxane surfactant, and (ii) at least one fluorinated surfactant of the formula $[R(f)Q]_nA$ wherein R(f) is a perfluoroalkyl group having 6 to 22 carbon atoms, Q is a divalent bridging group, A is a water soluble group, and n is 1 or 2. (Note that the disclosed fluorinated surfactants are from C6 to C22 fluorinated surfactants, not C4 fluorinated surfactants.)

The disclosure of Held fails to teach or suggest an inkjet ink composition comprising one or more specific fluorochemical surfactants recited in Applicants' independent claim 1.

The Office Action relies on the teaching of Savu to allegedly cure the above-noted deficiencies in the disclosure of Held.

The disclosure of Savu is directed to fluorochemical sulfonamide surfactants. The disclosed fluorochemical sulfonamide surfactants are identical to those recited in Applicants' independent claim 1. In fact, the disclosure of Savu, which is assigned to The 3M Company, the assignee of the present application, is specifically incorporated by reference into the present application on page 13, lines 19-23 of Applicants' specification.

The disclosure of Savu provides a variety of suitable applications for using the disclosed fluorochemical sulfonamide surfactants; however, the disclosure of Savu does not teach or suggest the use of the disclosed fluorochemical sulfonamide surfactants in an ink jet ink composition. In fact, the disclosure of Savu teaches away from the use of the disclosed fluorochemical sulfonamide surfactants in ink jet applications due to their ability to form foam. As disclosed on page 22, lines 7-25, the teaching of Savu discloses the positive attributes of the disclosed fluorochemical sulfonamide surfactants when used in the oil industry. Applicants respectfully submit that one of ordinary skill in the art given the teaching of Savu would not have expected the disclosed fluorochemical sulfonamide surfactants to be suitable for use in ink jet applications.

The Office Action suggests that one of ordinary skill in the art, given the teaching of Held, would have (1) realized that the teaching of Held had one or more shortcomings related to the disclosed surfactant system, (2) sought out the teaching of Savu directed to foam-generating fluorinated surfactants, and (3) substituted one or more fluorochemical sulfonamide surfactants from the teaching of Savu for the fluorinated surfactant within the disclosure of Held. The Office Action specifically states on page 3, lines 8-14:

It would have been obvious to one skilled in the art to select a fluoroalcohol substituted monoether with polyethylene glycol as the fluorinated surfactant in the compositions disclosed by Held because Held uses a fluoroalcohol substituted monoether with polyethylene glycol in the examples (see Ink preparations 2, 3 and 4). It would further have been obvious to one skilled in the art to substitute a fluorochemical surfactant taught by WO'873 for the fluorinated surfactants containing a perfluoralkyl group and polyether groups taught by Held in the compositions disclosed by Held, with the expectation of providing similar or improved surfactant properties.

Applicants disagree.

Applicants respectfully submit that the teaching of Held fails to teach or suggest any of the specific fluorochemical surfactants recited in Applicants' independent claim 1. The disclosure of Held is directed to a specific surfactant system consisting essentially of a siloxane surfactant in combination with a fluorinated surfactant, wherein the fluorinated surfactant has a specific chemical structure as described above. The disclosed fluorinated surfactants do not have a chemical structure as recited in Applicants' independent claim 1. Further, there is no

suggestion in the teaching of Held that would have lead one skilled in the art to the specific fluorochemical surfactants recited in Applicants' independent claim 1.

Applicants further respectfully submit that the disclosure of Held fails to provide motivation to one skilled in the art to seek out fluorinated surfactants other than those specifically disclosed in the teaching of Held, namely, fluorinated surfactants having a formula $[R(f)Q]_nA$ wherein R(f) is a perfluoroalkyl group having 6 to 22 carbon atoms, Q is a divalent bridging group, A is a water soluble group, and n is 1 or 2. Certainly, the disclosure of Held does not provide motivation to one skilled in the art to substitute a C4 fluorochemical sulfonamide surfactant as disclosed in Savu for the C6 to C22 fluorinated surfactants in the surfactant system disclosed in Held. In fact, the teaching of Held teaches away from such a substitution given that the teaching of Held specifically requires C6 to C22 fluorinated surfactants to be used in combination with the disclosed siloxane surfactant in order to produce the disclosed surfactant system.

It is not clear to Applicants why one of ordinary skill in the art would have modified the teaching of Held as proposed in the Office Action, namely, to substitute a C4 fluorochemical sulfonamide surfactant as disclosed in the teaching of Savu for a C6 to C22 fluorinated surfactant in the surfactant system disclosed in Held. Applicants respectfully submit that the only motivation for such a modification of the teaching of Held has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the art.

For at least the reasons given above, Applicants respectfully submit that a *prima facie* case of obviousness has not been made, and that the combination of the teaching of Held with the teaching of Savu fails to make obvious Applicants' claimed invention as embodied in independent claim 1. Since claims 2-13, 18-21, 23 and 26-30 depend from independent claim 1, and recite additional claim features, Applicants respectfully submit that the combination of the teaching of Held with the teaching of Savu fails to make obvious claims 2-13, 18-21, 23 and 26-30. Accordingly, Applicants respectfully request withdrawal of this rejection.

Rejection of Claims 1-13, 18-23 and 26-30 In View Of Pearlstine In Combination With Savu

Claims 1-13, 18-23 and 26-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over European Patent Application No. 0974626 A1 to Pearlstine et al. (hereinafter, "Pearlstine") in view of Savu. This rejection is respectfully traversed.

A description of Applicants' claimed invention embodied in independent claim 1 and the disclosure of Savu may be relied upon above.

The disclosure of Pearlstine relates to ink jet ink compositions containing a siloxane surfactant or a fluorinated surfactant of the formula $[R(f)Q]_nA$ wherein R(f) is a perfluoroalkyl group having 6 to 22 carbon atoms, Q is a divalent bridging group, A is a water soluble group, and n is 1 or 2. It should be noted that Pearlstine and Held are both assigned to E.I. DuPont de Nemours and Company, and both disclose identical C6 to C22 fluorinated surfactants, which differ in structure from the specific C4 fluorochemical surfactants recited in Applicants' independent claim 1.

The Office Action uses the same reasoning to combine the teaching of Pearlstine with the teaching of Savu and reject Applicants' claimed invention as embodied in independent claim 1. In particular, the Office Action suggests that one of ordinary skill in the art, given the teaching of Pearlstine, would have (1) realized that the teaching of Pearlstine had one or more shortcomings related to the disclosed surfactants, (2) sought out the teaching of Savu, and (3) substituted one or more C4 fluorochemical sulfonamide surfactants from the teaching of Savu for the C6 to C22 fluorinated surfactant within the disclosure of Pearlstine.

Applicants respectfully submit that the teaching of Pearlstine fails to teach or suggest any of the specific C4 fluorochemical surfactants recited in Applicants' independent claim 1. The disclosure of Pearlstine is directed to specific C6 to C22 fluorinated surfactants, which differ from the C4 surfactants recited in Applicants' independent claim 1. Further, there is no suggestion in the teaching of Pearlstine that would have lead one skilled in the art to the specific fluorochemical surfactants recited in Applicants' independent claim 1.

Applicants further respectfully submit that the disclosure of Pearlstine fails to provide motivation to one skilled in the art to seek out fluorinated surfactants other than those

specifically disclosed in the teaching of Pearlstine, namely, fluorinated surfactants having a formula $[R(f)Q]_nA$ wherein R(f) is a perfluoroalkyl group having 6 to 22 carbon atoms, Q is a divalent bridging group, A is a water soluble group, and n is 1 or 2. Certainly, the disclosure of Pearlstine does not provide motivation to one skilled in the art to substitute a C4 fluorochemical sulfonamide surfactant as disclosed in Savu for a C6 to C22 fluorinated surfactant disclosed in Pearlstine.

It is not clear to Applicants why one of ordinary skill in the art would have modified the teaching of Pearlstine as proposed in the Office Action, namely, to substitute a C4 fluorochemical sulfonamide surfactant as disclosed in the teaching of Savu for a C6 to C22 fluorinated surfactant disclosed in Pearlstine. Applicants respectfully submit that the only motivation for such a modification of the teaching of Pearlstine has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the art.

For at least the reasons given above, Applicants respectfully submit that a *prima facie* case of obviousness has not been made, and that the combination of the teaching of Pearlstine with the teaching of Savu fails to make obvious Applicants' claimed invention as embodied in independent claim 1. Since claims 2-13, 18-23 and 26-30 depend from independent claim 1, and recite additional claim features, Applicants respectfully submit that the combination of the teaching of Held with the teaching of Savu fails to make obvious claims 2-13, 18-23 and 26-30. Accordingly, Applicants respectfully request withdrawal of this rejection.

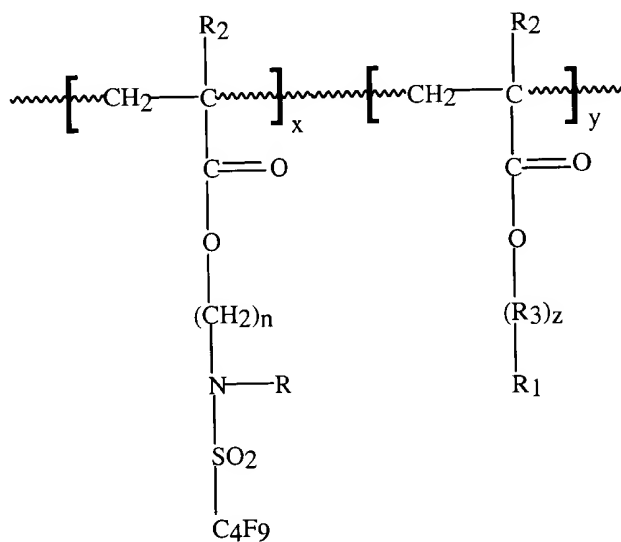
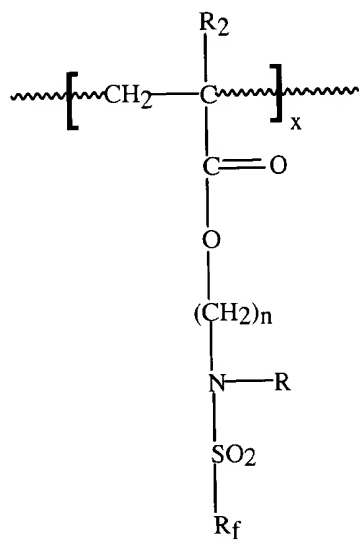
Rejection of Claims 1-17, 19-29 and 33 In View Of Caiger In Combination With Savu

Claims 1-17, 19-29 and 33 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,114,406 to Caiger et al. (hereinafter, "Caiger") in view of Savu. This rejection is respectfully traversed.

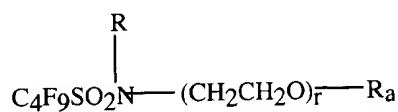
A description of Applicants' claimed invention embodied in independent claim 1 and the disclosure of Savu may be relied upon above.


Applicants' claimed invention, as embodied in independent claim 33, is directed to an ink jet printable radiation curable composition comprising, *inter alia*, a vehicle comprising a

polymerizable material; a photoinitiator; and a fluorochemical surfactant; wherein no colorant is present; and further wherein the fluorochemical surfactant comprises one or more surfactants having one or more chemical structures selected from:



and



wherein  represents a bond in a polymer chain; R_f is -C₄F₉ or -C₃F₇; R, R₁, R₂ and R_a are each independently hydrogen or alkyl groups having 1 to 4 carbon atoms; R₃ comprises one or more straight or branched polyalkylene-oxy groups having 2 to 6 carbon atoms in each group; n is an integer from 2 to 10; x, y and z are integers of at least 1; and r is an integer of 2 to 20.

The disclosure of Caiger relates to radiation curable ink compositions containing a polyfunctional alkoxyated and/or polyfunctional polyalkoxyated acrylate monomer material, and a photoinitiator. The disclosed compositions may also include non-alkoxyated radiation curable monomers, surfactants, photoinitiator stabilizers, etc. Caiger discloses the use of a C8 fluorinated surfactant, Fluorad 430, in column 3, lines 52-55.

The disclosure of Caiger fails to teach or suggest an inkjet ink composition comprising one or more specific C4 fluorochemical surfactants recited in Applicants' independent claim 1.

The Office Action relies on the teaching of Savu to allegedly cure the above-noted deficiencies in the disclosure of Caiger.

The Office Action suggests that one of ordinary skill in the art, given the teaching of Caiger, would have (1) realized that the teaching of Caiger had one or more shortcomings related to surfactants, (2) sought out the teaching of Savu, and (3) substituted one or more C4 fluorochemical sulfonamide surfactants from the teaching of Savu for the C8 fluorinated surfactant within the disclosure of Caiger. The Office Action specifically states on page 3, lines 8-14:

It would have been obvious to one skilled in the art to employ the fluorochemical surfactants taught by WO'873 as the fluoro surfactant in the ink compositions disclosed in Caiger et al. Caiger et al. teach that the surfactant is preferably a nonionic surfactant and a fluoro surfactant, thus providing motivation to employ nonionic fluorosurfactants in the disclosed ink compositions.

Applicants disagree.

Applicants respectfully submit that the disclosure of Caiger fails to provide motivation to one skilled in the art to seek out the specific fluorochemical sulfonamide surfactants disclosed in the teaching of Savu. The disclosure of Caiger already discloses suitable fluoro surfactants, such as the C8 surfactant Fluorad FC430, for use in the ink compositions

disclosed in Caiger. See, Caiger, column 3, lines 52-55. It is not clear to Applicants why one of ordinary skill in the art would have (i) sought out the teaching of Savu and (ii) replaced an acceptable C8 fluoro surfactant as disclosed in the teaching of Caiger with a specific C4 fluorochemical sulfonamide surfactant disclosed in the teaching of Savu. Applicants respectfully submit that the only motivation for such an alteration of the teaching of Caiger has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the art.

For at least the reasons given above, Applicants respectfully submit that a *prima facie* case of obviousness has not been made, and that the combination of the teaching of Caiger with the teaching of Savu fails to make obvious Applicants' claimed invention as embodied in independent claims 1 and 33. Since claims 2-17 and 19-29 depend from independent claim 1, and recite additional claim features, Applicants respectfully submit that the combination of the teaching of Caiger with the teaching of Savu fails to make obvious claims 2-17 and 19-29. Accordingly, Applicants respectfully request withdrawal of this rejection.

Rejection of Claims 1-13, 15-23 and 26-30 In View Of Breton In Combination With Savu

Claims 1-13, 15-23 and 26-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,863,320 to Breton et al. (hereinafter, "Breton") in view of Savu. This rejection is respectfully traversed.

A description of Applicants' claimed invention embodied in independent claim 1 and the disclosure of Savu may be relied upon above.

The disclosure of Breton relates to ink compositions containing a perfluorosurfactant. A list of suitable perfluorosurfactants is given in column 3, lines 38-48.

The disclosure of Breton fails to teach or suggest an inkjet ink composition comprising one or more specific C4 fluorochemical surfactants recited in Applicants' independent claim 1.

The Office Action relies on the teaching of Savu to allegedly cure the above-noted deficiencies in the disclosure of Breton.

The Office Action suggests that one of ordinary skill in the art, given the teaching of Breton, would have (1) realized that the teaching of Breton had one or more shortcomings related to the disclosed perfluorosurfactants, (2) sought out the teaching of Savu, and (3) substituted one or more fluorochemical sulfonamide surfactants from the teaching of Savu for the perfluorosurfactant within the disclosure of Breton. The Office Action specifically states on page 6, lines 1-5:

It would have been obvious to one skilled in the art to employ the fluorochemical surfactants taught by WO'873 as the perfluorosurfactant in the ink compositions disclosed by Breton et al. Breton et al. teach that the surfactant is preferably a perfluorooctanesulfonamide ethylacrylate, thus providing motivation to employ perfluoro- sulfonamide ethylacrylate fluorosurfactants in the disclosed ink compositions.

Applicants disagree.

Applicants respectfully submit that the disclosure of Breton fails to provide motivation to one skilled in the art to seek out the specific fluorochemical sulfonamide surfactants disclosed in the teaching of Savu. The disclosure of Breton discloses suitable perfluorosurfactant, such as perfluorooctanesulfonamide ethylacrylate, for use in the ink compositions disclosed in Breton. It is not clear to Applicants why one of ordinary skill in the art would have (i) sought out the teaching of Savu and (ii) replaced one of the acceptable perfluorosurfactant as disclosed in the teaching of Breton with a specific fluorochemical sulfonamide surfactant disclosed in the teaching of Savu. Applicants respectfully submit that the only motivation for such an alteration of the teaching of Breton has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the art.

For at least the reasons given above, Applicants respectfully submit that a *prima facie* case of obviousness has not been made, and that the combination of the teaching of Breton with the teaching of Savu fails to make obvious Applicants' claimed invention as embodied in independent claim 1. Since claims 2-13, 15-23 and 26-30 depend from independent claim 1, and recite additional claim features, Applicants respectfully submit that the combination of the teaching of Breton with the teaching of Savu fails to make obvious claims 2-13, 15-23 and 26-30. Accordingly, Applicants respectfully request withdrawal of this rejection.

Rejection of Claims 1-13, 15-30 and 33 In View Of Smith In Combination With Savu

Claims 1-13, 15-30 and 33 are rejected under 35 U.S.C. §103(a) as being unpatentable over International Publication No. WO 99/07796 to Smith (hereinafter, "Smith") in view of Savu. This rejection is respectfully traversed.

A description of Applicants' claimed invention embodied in independent claims 1 and 33, and the disclosure of Savu may be relied upon above.

The disclosure of Smith relates to ink compositions containing a fluorinated surfactant. Smith discloses the use of Fluorad FC129 (a C8 fluorinated surfactant) throughout the examples.

The disclosure of Smith fails to teach or suggest an inkjet ink composition comprising one or more specific C4 fluorochemical surfactants recited in Applicants' independent claim 1.

The Office Action relies on the teaching of Savu to allegedly cure the above-noted deficiencies in the disclosure of Smith.

The Office Action suggests that one of ordinary skill in the art, given the teaching of Smith, would have (1) realized that the teaching of Smith had one or more shortcomings related to the disclosed C8 fluorinated surfactants, (2) sought out the teaching of Savu, and (3) substituted one or more C4 fluorochemical sulfonamide surfactants from the teaching of Savu for the C8 fluorinated surfactant within the disclosure of Smith. Applicants disagree.

Applicants respectfully submit that the disclosure of Smith fails to provide motivation to one skilled in the art to seek out the specific fluorochemical sulfonamide surfactants disclosed in the teaching of Savu. The disclosure of Smith discloses a suitable fluorinated surfactant for use in the ink compositions disclosed in Smith. It is not clear to Applicants why one of ordinary skill in the art would have (i) sought out the teaching of Savu and (ii) replaced one of the acceptable fluorinated surfactants as disclosed in the teaching of Smith with a specific fluorochemical sulfonamide surfactant disclosed in the teaching of Savu. Applicants respectfully submit that the only motivation for such an alteration of the teaching of

Smith has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the art.

Further, in regard to independent claim 33, it should be noted that the disclosure of Smith does not suggest to one of skill in the art to remove the colorant disclosed in each of the ink compositions of Smith.

For at least the reasons given above, Applicants respectfully submit that a *prima facie* case of obviousness has not been made, and that the combination of the teaching of Smith with the teaching of Savu fails to make obvious Applicants' claimed invention as embodied in independent claim 1. Since claims 2-13 and 15-30 depend from independent claim 1, and recite additional claim features, Applicants respectfully submit that the combination of the teaching of Smith with the teaching of Savu fails to make obvious claims 2-13 and 15-30. Accordingly, Applicants respectfully request withdrawal of this rejection.

Rejection of Claims 31-32 In View Of Smith, Held, Pearlstine, Caiger or Breton
In Combination With Savu and Adkins

Claims 31-32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith, Held, Pearlstine, Caiger or Breton in view of Savu, and further in view of U.S. Patent No. 6,113,679 to Adkins et al. (hereinafter, "Adkins"). This rejection is respectfully traversed.

A description of Applicants' claimed invention embodied in independent claim 1, and the disclosures of Smith, Held, Pearlstine, Caiger, Breton and Savu may be relied upon above.

Claims 31-32 are directed to a retroreflective article containing a substrate comprises polymethyl methacrylate having printed thereon the ink jet ink composition of independent claim 1. Applicants respectfully submit that claims 31-32 are patentable over the disclosures of Smith, Held, Pearlstine, Caiger, Breton and Savu for at least the reasons given above with regard to independent claim 1. Applicants further respectfully submit that claims 31-32 are patentable over the disclosures of Smith, Held, Pearlstine, Caiger, Breton, Savu and Adkins for at least the following reasons.

The disclosures of Smith, Held, Pearlstine, Caiger, Breton and Savu fail to teach or suggest an inkjet ink composition comprising one or more specific fluorochemical surfactants recited in Applicants' independent claim 1. The Office Action relies on the teaching of Adkins to allegedly cure the above-noted deficiencies in the disclosure of disclosures of Smith, Held, Pearlstine, Caiger, Breton and Savu.

The disclosure of Adkins is directed to ink jet ink compositions containing fluorinated surfactants and the use of the ink jet ink compositions to print retroreflective films. See, Adkins, column 6, lines 28-33. It should be noted that Adkins discloses C8 fluorinated surfactants, not C4 fluorinated surfactants as recited in Applicants' independent claim 1 (and dependent claims 31-32). See, Adkins, column 9, lines 32-45.

Applicants respectfully submit that the teaching of Adkins fails to cure the above-noted deficiencies in the combinations of any of the teachings of Smith, Held, Pearlstine, Caiger or Breton with the teaching of Savu. The disclosure of Adkins further supports Applicants' position, namely, that there is no suggestion in the disclosures of Smith, Held, Pearlstine, Caiger, Breton or Adkins to seek out a C4 fluorinated surfactants as recited in Applicants' independent claim 1 given that each of the disclosures of Smith, Held, Pearlstine, Caiger, Breton and Adkins teach the use of fluorinated surfactants other than C4 fluorinated surfactants. Further, the disclosure of Savu actually teaches away from the use of C4 fluorinated surfactants in ink jet ink compositions given that the disclosed C4 fluorinated surfactants are useful in generating foam, as in the oil industry.

For at least the reasons given above, Applicants respectfully submit that a *prima facie* case of obviousness has not been made, and that the combination of any of the teachings of Smith, Held, Pearlstine, Caiger and Breton with the teaching of Savu, and further the teaching of Adkins, fails to make obvious Applicants' claimed invention as embodied in claims 31-32. Accordingly, Applicants respectfully request withdrawal of this rejection.

II. Conclusion:

For at least the reasons given above, Applicants submit that claims 1-33 define patentable subject matter. Accordingly, Applicants respectfully request allowance of these

Amendment And Response
Serial No. 09/911,279

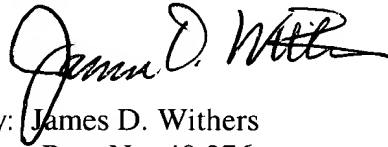
claims.

No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 13-2725.

Should the Examiner believe that anything further is necessary to place the application in better condition for allowance, the Examiner is respectfully requested to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,

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